

I N S E C T C O N T R O L W O R K .

NORTHWEST SIDE OF BIGHOLE BASIN

PRELIMINARY EXAMINATION.

Insect infestation in the Big Hole region was first brought to the notice of the Forest Service in the summer of 1911. Men who were making a preliminary timber reconnaissance reported the existence of extensive infestation in the lodge-pole pine on the Thompson Creek drainage. Specimens were submitted to the Bureau of Entomology and the dangerous infesting beetle was identified as *dendroctonus monticolae*.

Eng Without any extensive investigation, it was decided that control work should be initiated during the spring of 1912. Preparations were made to conduct this work on a large scale. After a visit to the area by a representative of the Bureau of Entomology, it seemed that the work necessary to be done would be much less than at first anticipated.

Preparations for an extensive campaign were then stopped and plans made to carry out the work on a much smaller scale. As the season advanced it was seen that the infestation was much more serious in character and a hurried attempt was made to do as much as possible in the short time remaining before the emergence of the beetles. By the last week in June work was under way and was continued until July 23rd, when the

emergence of the beetles in large numbers brought the work to a close for that season.

During this campaign 584 trees were felled, limbed and peeled, and the resulting brush piled and 1842 trees were peeled standing. The trees felled were peeled to an average length of 22 feet and those peeled standing to a height of 8 feet. The cost of the operation was \$1,734.60. By timing the different operations it was found that the cost of felling was about 4 1/2 times the cost of peeling the standing trees. The costs of this operation were not considered representative for the following reasons:

1. Frequent changes in plans raised the cost and hindered the work.
2. The most suitable tools were not used on the work.
3. Trees were felled, limbed, bucked up and the resulting brush piled at a cost in time and labor out of proportion to the results obtained from a control stand-point. By the substitution of long handled peeling spuds, equally effective, control work could be done at a much lower cost per tree.

It was felt that this work was only a beginning and that much more would have to be done in the following spring.

In October, 1912, a preliminary reconnaissance was made to determine the extent of infestation. It was found that there were groups of infested trees ranging from ten to two thousand or more in number scattered over an area about 35 miles in length by two to four miles in width along the edge of the timber on the northwest side of the Big Hole Basin.

The Bureau of Entomology directed a man to mark the infested timber so that an accurate estimate of the work to be done in the spring of 1913 could be made. Later an additional man was sent to help with the work, and for six weeks during January and February, two men from the Forest Service were also engaged in marking the infested timber. In all about 18,000 trees were marked for treatment and the infested groups so marked were noted on a map of the area. With this preliminary work as a basis, the control work in 1913 was initiated.

I N S E C T C O N T R O L W O R K.

May 17 - July 10, 1913.

General Plan of Campaign.

By reference to the map which accompanies and forms a part of this report it will be seen that the territory to be covered extended from the Battleground Ranger Station near Trail Creek on the southwest to the West branch of Fishtrap Creek on the northeast. As shown by the map this area is approximately 30 miles in length and the infested timber extended back into the Forest for a distance varying from two to four miles.

The general plan contemplated the treatment of the trees at both ends of this area first, and working toward the middle of the infestation, so that the trees, if any, left untreated would be centralized around Thompson Creek, and next year's infestation would thus be easier to handle. In actual

practice local conditions made it necessary to depart somewhat from this original plan, but as the whole area was completely and thoroughly treated the desired result was fully obtained.

In the work of the preceeding year several facts had been clearly shown.

1. That the excessive cost of felling, limbing and bucking up the trees and piling the resulting brush did not warrant this method of treatment if the desired result could be obtained in any other way.

2. The light short landed peeling spud in use last year was not a suitable tool for this work.

It was decided that suitable peeling spuds with handles of differing lengths would enable the men to peel the trees to any necessary height and at the same time avoid the high felling and brush piling charges. Different spuds were tried out beforehand and one was adopted which met every requirement. The tool itself was of steel and weighed about two and one-half pounds. The blade was shaped like a chisel and had a 4" cutting edge, was about 6" in length and tapered from a knife edge to a thickness of 1/2". The blade and the socket which provided for a pole handle 1 1/2" in diameter were forged from a single piece of steel. A good idea of the appearance of this tool can be obtained from the photograph which accompanies this report. The spuds were obtained at a cost of \$16.00 per dozen through the Missoula Mercantile Co., of Missoula, Montana. It is not necessary to buy handles for these tools as the men prefer to fit

them with light pine poles of the required length.

ORGANIZATION.

The territory treated is located partly on the Deerlodge and partly on the Beaverhead National Forests, Pintlar Creek as shown on the map being the dividing line. To simplify administration the control work was carried on under the supervision of the Deerlodge, with an Assistant Forest Ranger in charge.

Camp No. 1 was established on Pintlar Creek May 20 and actual treating of trees began on the 21st. Camp No. 2 was established on the South Fork of Thompson Creek and control work started on May 22. Camp No. 3 was located on Musigbrod Creek on May 27. Camp No. 4 was organized on June 3 to treat the isolated groups of infested trees northeast of Pintlar Creek and moved to its first camp on Dry Gulch. The organization, equipment, movements and work accomplished by these camps is shown in the following detailed statements. A summary of the work of all the camps combined is also attached to this report with a cost summary showing an analysis of the costs per tree.

Seven photographs with explanatory notes are included to illustrate some features of the work.

GENERAL INFORMATION.

The work was scattered along the Forest boundary for 35 miles, 55 miles from the Supervisor's headquarters to the center of the work. The contract for supplies was given to a Mercantile Company whose store was 55 miles from the railroad, and an average of fifteen miles from the work. The mercantile company carried a large stock of goods and with the assistance of their freight teams was able to land nine tons of supplies on the ground on short notice. A telephone could usually be reached in from two to five miles from work. Mail was received three times a week about six miles from the work. Beef was purchased from ranchers as near the work as possible. As no vegetables were raised in this locality, prices for all such supplies were very high.

Work was performed every day no attention being paid to Sundays or holidays. This arrangement was very satisfactory to the laborers.

The time was kept on the eight hour basis to the nearest thirty minutes. Eight hours was considered a day's work. The men had to go to and from work on their own time.

The rate of wages was 38 cents per hour or \$3.04 per day for eight hours, and the men were charged 75 cents per day for board. It was necessary to pay this rate of wages in this locality at this time of year, and it would have been necessary to pay better wages than this after July 10, on account of the haying season which commences at this date. Free transportation, without board, was furnished the men from Butte or Anaconda, to the work. When the work was closed down the

majority of the men went to work for local ranchers, and two cooks were the only men furnished return transportation. It was necessary to have four-horse teams on this work, as the ground was so soft and the water so high a single team could not move an empty wagon, and the moving of the larger camps was not attempted without a six-horse team.

It took the teamster two days to make a trip for supplies owing to the long detours around washed out bridges and swampy meadows.² Two Government and two private teams were used throughout the work, and extra teams were hired when needed.

It rained almost every day during the progress of the work. The trees peeled easier when wet than when dry, and as the men were willing to work in the rain, it was a benefit instead of a detriment to the work.

It is expected that a supplementary report covering the entomological features of the work will be prepared by the man assigned to insect control for District I.

CHRONOLOGICAL OUTLINE.

Assistant Ranger in charge left Anaconda the morning of May 17 and arrived at Pintlar Creek that night. On the 18th picked out location for Pintlar Creek Camp No. 1, team hired and two local men hired to put up camp. May 19 supplies to open three camps ordered from Wisdom and a six horse team hired to move them to a general distributing point. Two wagon loads of supplies, equipment and men left Anaconda for Camp I in A. M.

May 20th. Camp No. 1, Pintlar Creek erected complete and supplies moved in. Cook, two foremen and ten choppers arrive in P.M.

May 21. Started treating trees at Camp No. 1, in A. M. moved in equipment and supplies and erected Camp No. 2 complete. Foremen and 11 men arrived in P.M.

May 22. Started work treating trees in A.M. on the north side of the south fork of Thompson Creek, 9 men arrived in evening and were later assigned to Camp No. 3.

May 23. The men for Camp No. 3 were put to work in A. M. on the ridge between south fork of Thompson Creek and Mussigbrod Creek and were taken care of at Camp No. 2 until the timber on and south of Mussigbrod Creek could be cruised out and the camp located closer to the work.

May 27. Camp No. 3 equipment and supplies moved in and the camp erected complete. Cook and additional men arrived in P.M.

June 3. Camp No. 4 organized with foreman, cook and five men, camp moved in to Dry Gulch.

June 13. Camp No. 4 moved to Mudd Creek.

June 20. Camp No. 4 moved to Fishtrap Creek.

June 23. Moved Camp No. 1 to the North Fork of Thompson Creek.

June 25. Moved Camp No. 4 to Battle Ground.

June 27. Moved Camp No. 3 to South Fork of Johnson Creek.

June 29, Closed Camp No. 4.

June 30. Closed Camp No. 1.

July 6. Closed Camps No. 3 and 2.

July 10. Assistant Ranger in charge with teams and equipment arrived in Anacanda.

CAMP NO 1.

This camp was organized to treat Pintlar Creek, Glan Valley and all areas in between.

It was necessary that the camp be moved once. Supplies were delivered to this camp by four-horse freight team; the same team supplying Camps No. 2 and No. 3. It was necessary to have a team assigned to this camp part of the time, for the purpose of hauling the men to and from isolated areas and to assist the regular freight team in over a very bad section of road.

EQUIPMENT.

- 1 14x16 tent used for cook and dining tent.
- 1 7x9 tent used as store house.
- 1 10x12 tent used as sleeping and drying our tent.
- 3 7x9 sleeping tents.
- 1 team and wagon.

ORGANIZATION.

- Cruiser in charge.
- 1 to 2 foremen in charge of gangs as the conditions required.
- 1 cook.
- 6 to 14 laborers.

Camp opened May 20 and closed June 30, total 40 days.

- 6254 trees treated.
- 398 days labor performed.
- Average No. trees treated per labor day, 15.7

Average diameter of trees treated, 13 inches.
Average height of trees treated, 13 feet.

COST STATEMENT.

	Total Amt.	Per Tree
Supervision	\$338.90	\$.0540
Labor	882.54	.1413
Cook	105.00	.0162
Teamster	54.32	.0090
Subsistence	465.68	.0746
Horse feed	36.06	.0056
Travel, Express and freight	176.45	.0285
Tools & equipment	43.07	.0069
Total	\$2102.02	\$.3361

Camp No. 2.

This camp was organized to treat the area between the south Fork of Thompson Creek and Glan Valley.

Work was started at this camp May 22, and closed July 6, 45 days. This camp being centrally located was used as headquarters. It was necessary to have a pack horse to take dinner to the men working from this camp the greater portion of the time, as it was not practical to move the camp any further up the ridge, and was too steep a climb for the men to return for dinner.

EQUIPMENT.

- 1 14x16 cook and dining tent.
- 1 7x9 store tent.
- 1 14x16 office tent.
- 1 14x16 drying out and sleeping tent.
- 1 10x12 sleeping tent.
- 2 7x9 sleeping tents.
- 1 four-horse team and wagon for general freight work to all camps.
- 1 saddle horse
- 1 pack horse.

ORGANIZATION.

1 cruiser in charge.
2 foremen in charge of gangs.
1 Cook.
1 to 2 teamsters.
6 to twenty laborers.

Camp opened May 22, closed July 5, 45 days.

5868 trees treated
501 days' labor performed.
Average No. trees treated per labor day, 13.7
Average height of trees treated 11 feet.
Average diameter of trees treated 13 inches.

COST STATEMENT. 2

	Total Amt.	Per Tree
Supervision	\$443.25	.0645
Labor	1109.83	.1616
Cook	116.25	.0169
Teamster	68.25	.0099
Subsistence	535.09	.0852
Horse-feed	45.31	.0066
Travel, Express and freight	201.74	.0294
Tools and equipment,	54.11	.0079
Total	\$2625.03	\$.5820

CAMP NO. 3.

This camp was organized to treat from the south fork of Thompson Creek to Tie Creek. It was necessary to move this camp once.

Work begun May 23, closed July 6, 44 days. The first camp was located on Mussigbrod Creek about one mile below the lake. The second camp was located near the junction of the Forks of Johnson Creek.

Since this area was not previously mapped and the in-

feasted areas located, it was necessary to put on extra men cruising and locating the timber, increasing the cost of supervision.

EQUIPMENT.

- 1 14x16 cook and dining tent.
- 1 7x9 store tent.
- 1 10x12 office and sleeping tent.
- 2 10x12 sleeping tents.
- 2 7x9 sleeping tents.

ORGANIZATION.

- 1 cruiser in charge.
- 1 Assistant ranger cruising.
- 2 foremen in charge of gangs.
- 1 cook
- 6 to 16 laborers.

Camp opened May 23 and closed July 6, 44 days.

8370 trees treated.

456 labor days.

Average No. trees per labor day - 19.1

Average diameter - 11 inches.

Average height trees peeled 12 feet.

COST STATEMENT.

	Total Amt.	Per Tree.
Supervision	\$524.95	\$.0625
Laborers	953.59	.1137
Cook	105.00	.0124
Teamster	59.69	.0081
Subsistence	511.74	.0610
Horse-feed	59.62	.0046
Travel, express and freight	160.51	.0191
Tools and equipment	47.33	.0056
Total	\$2402.43	\$.2870

CAMP NO. 4.

This camp was organized for the purpose of treating

small isolated areas east of Pintlar Creek to Fishtrap Creek and in the vicinity of the Battle Ground Ranger Station. This necessitated that the camp be moved five times, one moving requiring two days. Ordinarily the cook moved camp without interfering with the work of the gang. The cook acting as teamster and secured his supplies from the nearest large camp in the vicinity in which they were working.

EQUIPMENT.

- 1 7x9 sleeping tent.
- 1 10x12 sleeping tent.
- 1 10x12 fly, used to cook under.
- 1 team and wagon.

ORGANIZATION.

- 1 Assistant Ranger in Charge.
- 1 cook who also acted as teamster.
- 5 laborers.

Camp opened June 3, and closed June 30, total 28 days.

1901 trees treated.
 123 days labor performed.
 Average No. trees treated per labor day, 15.5
 Average diameter trees treated, 13 inches.
 Average height trees treated, 11 feet.

COST STATEMENT.

	Total Amt.	Per Tree.
Supervision	\$95.56	\$.0502
Labor	278.42	.1464
Cook	70.00	.0368
Teamster	16.71	.0087
Subsistence	143.28	.0753
Horse-feed	11.10	.0056
Travel, express and freight	49.40	.0259
Tools and equipment	13.25	.0069
Total	\$677.72	\$.3560

SUMMARY OF COSTS.

		Per Tree
Supervision	\$1402.56	\$.0599
Labor	3224.38	.1380
Cook	396.25	.0170
Teamster	198.97	.0084
Subsistence	1705.80	.0729
Horse-feed	132.09	.0057
(Travel		
(Express		
(Freight	588.16	.0251
Tools & equipment	157.76	.0067
Total	\$7806.97	\$.3337

1460 days, laborers
Total number trees, 23393
Per labor day, 16
Total cost labor per tree \$.2253
Rations, 2353

Subsistence \$.725 per ration
Cook .169 " "
Total cost \$.894 " "

Tools and equipment includes tools worn out and lost and 20% depreciation on all tools purchased for this work.

Average diameter trees treated, 12 inches.
Average height " " 12 feet.
Minimum " " 2 feet.
Maximum " " 16 to 18 feet.

SUMMARY FOR WHOLE PROJECT.

ORGANIZATION.

Camp. No. 1.

1 assistant ranger in charge.
2 gang foremen.
1 cook
6 to 14 laborers.
1 team and teamster part of the time.

Camp. No. 2.

On account of the location of this camp it was considered the headquarter camp.

Camp 2 continued.

- 1 cruiser in charge.
- 2 gang foremen.
- 1 cook.
- 6 to 20 laborers.
- 1 teamster and four horse team.
- 1 saddle horse for assistant ranger in charge.
- 1 pack horse.

Camp No. 3.

- 1 cruiser in charge.
- 1 ass't ranger, assisting with cruising work.
- 2 foremen.
- 1 cook.
- 8 to 16 laborers.
- Team and teamster part of the time.

Camp No. 4.

- 1 ass't ranger in charge.
- 1 cook.
- 5 laborers.
- 1 team

Largest number of men working on job any one day, 68.

Each cruiser or foreman in charge of a camp was allowed to work out his organization to suit the conditions on the ground.

As a rule, it was found that one foreman could not handle more than 6 or 8 men and properly supervise the work. Some gangs were reorganized as follows:

Foreman, in charge, marked additional trees needing treatment, eliminated trees already marked which did not need treatment, and saw that trees were treated to proper height.

- 1 man who limbed up trees, piled the brush, etc.
- 4 men, short handled spuds.
- 1 man, medium spud.
- 1 man, long handled spud.

On other gangs the men with short handled spuds carried an axe and limbed and piled the brush on the trees they treated.

About 18,000 trees were marked before work commenced. Approximately 15% of this number were eliminated as not needing treatment during the work and enough additional trees were marked to make the total of 23,393 trees treated.

Dated at Anaconda, Montana,
July 31, 1913.

S. A. Wallace
Assistant Ranger in Charge.

Appd.

Aug. 1, 1913.

L. C. Stockdale.

Forest Supervisor.

S
Beaverhead-Deerlodge - Insects

August 5, 1913.

District Forester,
Missoula, Montana.

Dear Sir:

The following report is intended to cover some points not mentioned in detail in the regular report from the Deerlodge National Forest on the Beaverhead-Deerlodge control project.

First, regarding the actual work done.

The recommendations of the Bureau of Entomology specify that 50% to 75% of the infesting beetles should be destroyed in order to stamp out an infestation of *dendroctonus monticolae* in lodgepole pine. Knowing the extent and the character of the infestation, our first concern was to determine the cheapest method to be employed to obtain this result.

The experience in previous work had shown us that to fell, limb and peel the infested trees and pile the resulting brush is a slow and costly operation.

District Forester.

Likewise, the method of felling the trees, lopping the brush and burning the infested trunks as practiced on the Flathead Forest would not be feasible in this region both on account of the larger average size of the infested trees and the waste of timber which will doubtless be merchantable within two or three years.

After due consideration it was decided that the most practical and efficient method of treatment would be to peel the infested trees with a suitable peeling spud to the height required in particular cases up to the limit of efficiency by this method, which is approximately 18 feet. The average height to which the trees were peeled was about 12 feet, running from a minimum of 2 feet where the butt of the tree only contained living larvae to a height of 18 feet in trees containing larvae to that height or higher. By following this method we failed to treat that part of some trees in which the infestation reached a greater height than 18 feet. This condition existed in comparatively few cases. In probably 5 to 10 trees out of each 100 treated the infestation might extend up 20 to 25 feet and in 2 or 3 of these trees it might extend to 30 or 40 feet. But the very small percentage of beetles missed by this method was not large enough to render this method of treatment unsafe.

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The whole region from Battleground Ranger Station on Trail Creek to the West Branch of Fishtrap Creek was thoroughly covered. It is the writer's estimate that 90% of the beetles in the trees treated, taken as a whole, were killed, and that this 90% so killed represents fully 80% of all the live beetles in this region.

At this point it might be mentioned that the lack of sufficient technical experience on the part of the men available as foremen at the beginning of the work resulted in the treatment of many trees during the first part of the operation which could have been left unpeeled without danger. The writer was unable to reach the work until June 11th. By this time the foremen had learned fairly well to discriminate between infested trees in which the larvae had through some cause been killed out and those which contained live larvae. In about 10% of 15% of the trees blazed last winter, the larvae had since died. As the work progressed the various foremen became much more expert in marking and the percentage of trees treated unnecessarily or treated higher than the infestation required grew constantly smaller.

Throughout this region a large number of trees, possibly 50,000 to 75,000 were killed by the infestation of 1911. With the exception of about 2500 trees along

District Forester.

the North Fork of Thompson Creek this infestation was untreated in 1912. In many of these infested trees the dendroctonus larvae were attacked by a parasitic fly. The flies emerged from such trees during June and the first half of July this year and are covering pretty thoroughly all trees left untreated this season.

This parasite has been under observation during the period we were in the Bighole and the main facts of its life history have been observed. Oviposition takes place during June and the first half of July. The female bores through the bark, strikes the dendroctonus larval chamber underneath and deposits the egg on the body of the larva which, at the time of attack, is one-half to fully grown. In about a month the parasitic larva is fully developed, the dendroctonus has been killed and absorbed, and the larva of the parasite spins its cocoon in which it remains during the following winter and spring to emerge in the following June or July. Mating takes place at the time of emergence from the bark and ovipositing some time later.

One other important fact in relation to control work was established by the study of the life history of this parasite. The flies emerge from their cocoons during the last half of June and the first half

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of July when the dendroctonus larvae are fully developed and attack the bark beetle larvae at this time. Their attack will thus be concentrated on infested trees untreated at this date. Subsequent peeling of these trees will destroy both dendroctonus and parasite. In order to secure the greatest amount of aid in control work from this parasite it is advisable to have our control work completed before the emergence of the flies.

Specimens of this fly with notes on its life history have been submitted to the Bureau of Entomology with a request for identification of the insect and information which they may have concerning it.

The fly mentioned above appears to be the most important natural aid we have in this region for controlling the dendroctonus.

Some predatory insects were also observed. The one most frequently met with is the larva of a clerid beetle. This larva attacks the bark beetle in the larval, pupal and young beetle stages and is most effective in cleaning up the few beetles remaining in trees now dead, infested two years ago.

Other specimens of predatory larvae and insects were collected and will be submitted to the Bureau of Entomology for identification.

District Forester.

Woodpecker work where it occurs furnishes a good example of natural aid in the checking of infestation. Photographs accompanying the Deerlodge report illustrate this fact very clearly. The three-toes or hairy woodpecker seems to be the one most in evidence in this region; but the small amount of woodpecker work in comparison to the extent of the infestation makes it only a secondary factor not so important as in many other regions where the groups of infested trees are smaller.

One fact observed which caused some uneasiness was the occurrence of *dendroctonus monticolae* in the dead trees infested in the summer of 1911. In these trees the beetles were found in the first two feet of the butt of the tree. Some stragglers were found occasionally higher up but not in numbers sufficient to count. Examination of several hundred of such trees led to the following conclusion:

Probably 25% of the trees infested two years ago have 10 to 100 beetles in larval, pupal, or young beetle stage in the first two feet of the trunk with an average of about 20 beetles for trees so infested. As they are straggling along at different stages there will be no common date of emergence for any great number of them. The larval of the clerid beetle and other

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predatory insects are very abundant in these trees and will also serve to cut down materially the numbers which eventually emerge. The period of emergence appeared to start about July 10th for this class of trees and continued as the beetles matured from that date on.

In the vicinity of the control work attempted in 1912 on Thompson Creek, some interesting facts were noted. Over 3,000 trees were blazed last winter in this locality and judging from our experience in other parts of the infested territory, an overrun of at least 15% might be expected. This would make the probable number of trees to be treated about 3,500. Of this number it was only necessary to treat about 2,000 trees, including all trees previously blazed and all additional trees examined and found to require treatment at the time of the control work. Furthermore, the infestation in these trees, with the exception of a few small groups, was confined exclusively to the lower part of the trunk. In the majority of cases it did not extend up over three feet from the ground. Some of the trees which the writer noted last winter as heavily infested and full of living larvae at that time did not contain any larvae or beetles in any stage of development at the time of control operations in June. Whether the beetles were

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winter-killed or destroyed by some fungus or mould disease I am not able to state definitely.

The main galleries and larval mines contained a fungus growth, black at the base and shading to white at the tips of the fungus filaments. The remains of eggs and larvae observed in these trees had the appearance of black rubber. Specimens showing these conditions were collected and will be submitted to the District Pathologist for examination.

A very small active black beetle of the Staphylinidae could be found in nearly all of the infested trees, in the dendroctonus galleries. It was not definitely determined whether this beetle attacked live larvae or simply lived on those which were dead.

Three species of dendroctonus were found in this region. The most important was dendroctonus monticolae, the chief infesting beetle attacking lodgepole, limber pine, and western yellow pine.

Dendroctonus pseudotsugae occurred in Douglas fir windfalls, but was not observed in any living trees.

Dendroctonus valens, the red turpentine beetle, was represented by a single specimen found at the base of a lodgepole infested by monticolae in 1911.

While it is confidently believed that the control work has been a complete success, it is respectfully

District Forester.

recommended that this area and adjacent territory be thoroughly cruised this fall. Two men, starting at Trail Creek on September 15, should complete an examination of the whole intervening region to Seymore Creek by November 15. That part of this territory lying between the west branch of Fishtrap Creek and Seymore Creek should be examined with especial thoroughness as control work this season extended only to the west branch of Fishtrap and it is known that there are some scattered patches of infestation lying between Fishtrap and Seymore Creeks.

The best men available for this work are Ed. Kurtz, in charge of Camp I, during the work this spring, and William Thompson in charge of Camp 3. Both men are thoroughly competent to make the required examination and their work will be in every way reliable. The Supervisor of the Deerlodge Forest has their addresses and could make arrangements with them to do the work if authorized some time this month to do so.

In conclusion it is a pleasure to express appreciation for the thorough and efficient manner in which the control work was carried on. Whatever the results may be, the work of the men in charge of organization and administration is a credit to the Forest Service. The report of the Deerlodge Forest touches lightly on

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some of the difficulties encountered. But any one who came in contact with the work could not help being impressed by the energetic and businesslike way in which these obstacles were overcome and the project completed at a cost which is very low in proportion to the work accomplished.

Respectfully submitted,

S. St. J. Malven,

Deputy Forest Supervisor.

SS
Pi-D-2

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 1

ADDRESS REPLY TO
DISTRICT FORESTER
AND REFER TO:

S
Beaverhead-Deerlodge-Insects.



September 11, 1913.

District Forester,
Denver, Colorado.

Dear Sir:

The enclosed photographs are the ones referred to in the report on the Beaverhead - Deerlodge Insect Control Project which was forwarded to you on August 6.

The explanatory descriptions have been noted on the backs of the several prints.

Very truly yours,

D T Mason

Acting District Forester.

Enclosures.







Tools Used

The square axe was used by foremen and cruisers.

The short spud by cruisers and markers.

The double bitted axe was used for limbing and for peeling around the butts.

Three lengths of spud handles 4' 8' & 12' were found useful for peeling to various heights.



The two large trees in foreground
have been cleaned by wood-
pickers to a height of approx.
15!



Using the short handled Spud.



The medium length squid.



Comparative height of
wood pecker work (left hand tree
and control treatment (right
hand tree). About 15' in both cases.



About 4' of heavily infested
lodgepole trunk later cleaned
up by wood peckers.

SI
Pi - D-2.

August 25, 1913.

District Forester,
Missoula, Montana.

Dear Sir:

Your letter "S, Beaverhead-Deerlodge, Insects" of August 8, enclosing a copy of report on the insect work in District 1 is received.

This report is very interesting and it will no doubt prove of value to us in the event of similar trouble in this District. I wish to thank you very much for furnishing us with a copy.

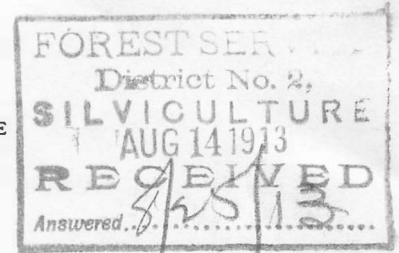
Very truly yours,

J. W. Nelson.

Acting District Forester.

Em
F. R. W.

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DISTRICT 1



ADDRESS REPLY TO
DISTRICT FORESTER
AND REFER TO:

FEDERAL BUILDING
MISSOULA, MONTANA

S
Beaverhead-Deerlodge-Insects , August 8, 1913.

District Forester,
Denver, Colo.

Dear Sir:

There is enclosed herewith a copy of a report dealing with insect control work on the principal project handled by District 1 up to date. It is thought the current season's work has been done in a very thorough manner and furnishes data of value to any one undertaking similar work in lodgepole type.

Very truly yours,

D T Mason

Acting District Forester.

Enclosure.